EA Engineering, Science, and Technology

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5 February 1998
EA Project No. 296.0043.3144

Ms. Donna Gaffigan
Bureau of Federal Case Management
New Jersey Department of Environmental Protection
401 E. State Street
CN 028
Trenton, New Jersey 08625

Re: Draft IR Program Site 1 Source Sampling Work Plan for Naval Air Warfare Center (NAWC), Trenton, New Jersey

Dear Ms. Gaffigan:

This letter details the Navy's plans for additional soil and soil vapor investigation at NAWC Trenton. During the Environmental Baseline Survey (EBS) Phase II investigation, the Navy performed direct-push soil vapor assessment (SVA) surveys at a number of EBS areas of concern to select soil sampling locations. Soil vapor samples were analyzed using a field gas chromatograph for selected volatile organic compounds (VOC), including benzene, toluene, ethylbenzene, and total xylenes (BTEX), cis- and trans-1,2-dichloroethylene, (1,2-DCE), 1,1,1-trichloroethane, trichloroethene (TCE), and tetrachloroethylene. To satisfy Installation Restoration Program (IRP) objectives, and to avoid duplication of effort, an overall SVA survey was also performed over the area between Buildings 40 and 41, and between Buildings 41 and 42 (designated as IRP Site 1) to address concerns of residual TCE in the soil due to TCE handling. SVA results at IRP Site 1 indicated elevated VOC concentrations in soil vapor samples from 16 locations (shown in bold on Figure 1). At three of these locations (IRP-SV27, IRP-SV64, and IRP-SV66), BTEX compounds were the primary constituents detected in the soil gas. At the remaining 13 locations, TCE and/or 1,2-DCE were the primary constituents detected. Results of this survey were reported in the Draft EBS Phase II Report for Parcel B (EA 1997).

The SVA survey performed at IRP Site 1 did not include analyses for vinyl chloride. Ground water at NAWC Trenton is known to be impacted by VOC (primarily TCE, 1,2-DCE, and vinyl chloride), and the Navy is presently preparing a Focused Feasibility Study (FFS) to address impacted ground water at IRP Site 1. Because the depth to ground water in IRP Site 1 is generally less than 10 ft, additional soil vapor assessment will be performed to evaluate potential vinyl chloride concentrations.

The objectives of this additional investigative work are as follows:

- Reassess soil vapor VOC concentrations (including vinyl chloride) at the 13 locations identified during the IRP Site 1 SVA survey in which TCE and/or 1,2-DCE were the primary constituents.
- Assess soil vapor VOC concentrations (including vinyl chloride) in the vicinity of monitoring wells in which previous ground-water analytical results indicate elevated concentrations of vinyl chloride. This includes the West Ditch area (Figure 1).
- Verify soil vapor assessment data with soil sampling and fixed-laboratory analyses to assess potential areas of impacted soil that may exceed applicable NJDEP soil cleanup criteria.
- Assess the source (soil or ground water) for VOC emissions at IRP Site 1.

This additional work will include:

- Passive soil gas sampling (1) near the 13 locations identified during the initial IRP Site 1 SVA survey in which elevated VOC concentrations consisted primarily of TCE and/or 1,2-DCE, and (2) in the West Ditch Area and in the vicinity of monitoring wells in which ground-water analytical results indicated elevated vinyl chloride concentrations (Figure 1).

- Installing soil borings and collecting soil samples from up to 21 locations reported to contain the highest soil vapor concentrations. This includes the locations identified during the initial IRP Site 1 SVA survey and other locations that may be identified based on passive soil gas sampling and analyses. Samples will be submitted for fixed laboratory analyses of Target Compound List (TCL) VOC and TPH.

The work detailed in this plan is an extension of work previously implemented at Site 1 as part of the EBS Phase II investigation and the IRP; therefore, the existing approved project plans will be used to perform the additional work. Field activities will be performed (except where modified in this work plan) in accordance with procedures in the EBS Phase II project plans (Work Plan [July 1996a], QAPjP [May 1996b], and SSHERP [October 1996c]), and in accordance with the NJDEP Technical Requirements for Site Remediation (N.J.A.C. 7:26E) and the NJDEP Field Sampling Procedures Manual (1992). The field sampling plan is outlined below.

Field Sampling Plan

Passive Soil Gas Sampling

A total of 45 passive soil gas samples will be collected within IRP Site 1. Samples will be collected from 13 locations where previous SVA results indicated elevated VOC concentrations in which the primary constituents included TCE and/or 1,2-DCE. An additional 32 samples will be collected from the West Ditch Area and in the vicinity of monitoring wells in which ground-water analytical results reported elevated vinyl chloride concentrations (Figure 1).

The passive soil gas sampler consists of a sampling tube (collector) which includes a clean glass sampling vial of known volume coated with an adsorbent (activated carbon) of known weight. The adsorbent is fused to the inside bottom of the glass vial, which is then thermally conditioned and sealed until installed, so that the atmosphere inside the glass vial remains inert.

Prior to the installation of the passive soil gas collector, sampling locations will be marked with stakes or similar materials. The 13 previously identified points will be located using existing survey data. For new sample locations, written utility clearance will be obtained from NAWC Trenton prior to intrusive activities.

At the sampling locations, a small pilot hole (approximately 1 to 2 in. diameter) will be installed approximately 2 to 3 ft below ground surface (bgs) using a hand auger or electric rotary hammer-drill. The sampling tube will be removed from its container, and the sample serial number and location number will be recorded in a field log book and on a chain-of-custody form. The soil gas collector will be unsealed and installed in the borehole on a steel wire in an inverted position. The hole will be sealed with aluminum foil and hydraulic cement (or native soil in unpaved locations) and then marked with a stake for identification and retrieval.

The sample collectors will remain in the ground for approximately 5 days (minimum of 3 days). Following this exposure time, the collectors will be removed and sealed with a Teflon-lined septa held by a crimped

aluminum cap immediately upon retrieval from the ground. The soil gas samples will then be returned to a fixed laboratory for analysis.

At the laboratory, the VOCs will be thermally desorbed from the carbon into the headspace of the sampling vial. A sample will be taken from the vial and analyzed via GC/MS using EPA Method 8260 procedures. Sample results will be reported in terms of micrograms/liter of analyte per sample. Analytes will include (but not be limited to) TCE, 1,2-DCE (cis and trans) and vinyl chloride.

A more detailed description of the passive soil gas sampling approach and procedure is attached.

Soil Boring and Sampling

Soil borings will be installed to collect soil samples following receipt of the passive soil gas sampling results. Thirteen soil borings will be installed at the locations identified during the previous IRP Site 1 SVA survey (shown in bold on Figure 1). Three borings will also be installed at the previous IRP Site 1 survey locations IRP-SV27, IRP-SV64, and IRP-SV66 in which BTEX compounds were the primary constituents detected in the soil gas. Additional soil borings (five assumed for planning purposes) will be installed at passive soil vapor sampling locations with the highest reported VOC concentrations. The soil borings will be advanced by direct push (DP) or hand auger (in areas not accessible to the DP-mounted truck). The borings will be advanced to a maximum depth of 10 ft bgs or until reaching ground water or until DP/hand auger refusal, whichever is encountered first. Samples will be collected continuously and every 2-ft interval will be screened with a PID. One sample from each boring will be selected for fixed-laboratory analyses based on the PID screening results. If PID measurements are equal and there are no physical indications of contaminants being present (i.e., staining or odor), the sample will be collected from a depth of approximately 2 to 3 ft bgs (approximate depth of the previously installed soil gas sample collector). The onsite geologist will make that determination in the field. For planning purposes, it is assumed that 21 borings will be installed and 21 soil samples will be collected and analyzed for TCL VOCs and TPH. The analytical methods for soil analyses, the number of samples, and the types of samples are shown in Table 1.

Soil boring installation and sampling procedures (including but not limited to project quality assurance, analytical methods; data reporting, sample documentation, custody, and shipping; and decontamination and waste handling procedures) will be in accordance with the EBS Phase II project plans (Work Plan, QAPjP, and SSHERP), and the NJDEP Field Sampling Procedures Manual (1992).

Surveying

Following completion of sampling activities, the passive soil gas and boring locations will be surveyed to establish horizontal coordinates and reference elevations by a licensed New Jersey land surveyor. The survey of sampling locations will be conducted in accordance with procedures detailed in the EBS Phase II project plans.

Reporting

Following receipt of laboratory analytical results, a brief report summarizing the results will be prepared and submitted to the Navy and NJDEP. The report will include a summary and an assessment of the passive soil gas survey results and soil sampling results, and a discussion of potential sources for the VOC detected in the soil gas. The report will also include maps depicting the soil vapor and soil analytical results, and recommendations as to whether institutional or engineering controls and/or remedial action is necessary.

This letter and the enclosed figure and table comprise the Site 1 Source Sampling Work Plan and are submitted as such for NJDEP approval. The scope of work outlined above will be performed in accordance with the approved EBS Phase II project plans, as amended above, in lieu of submitting separately bound plans for this additional work. Implementation of this scope of work is scheduled to begin the week of 9 February 1998, pending NJDEP approval. Your prompt review is appreciated.

If you have any questions, or need further information, please feel free to call me at (908) 665-2440.

Sincerely,

Steven G. Feldmann, P.G.
CTO Manager

SGF/pmy
Attachments
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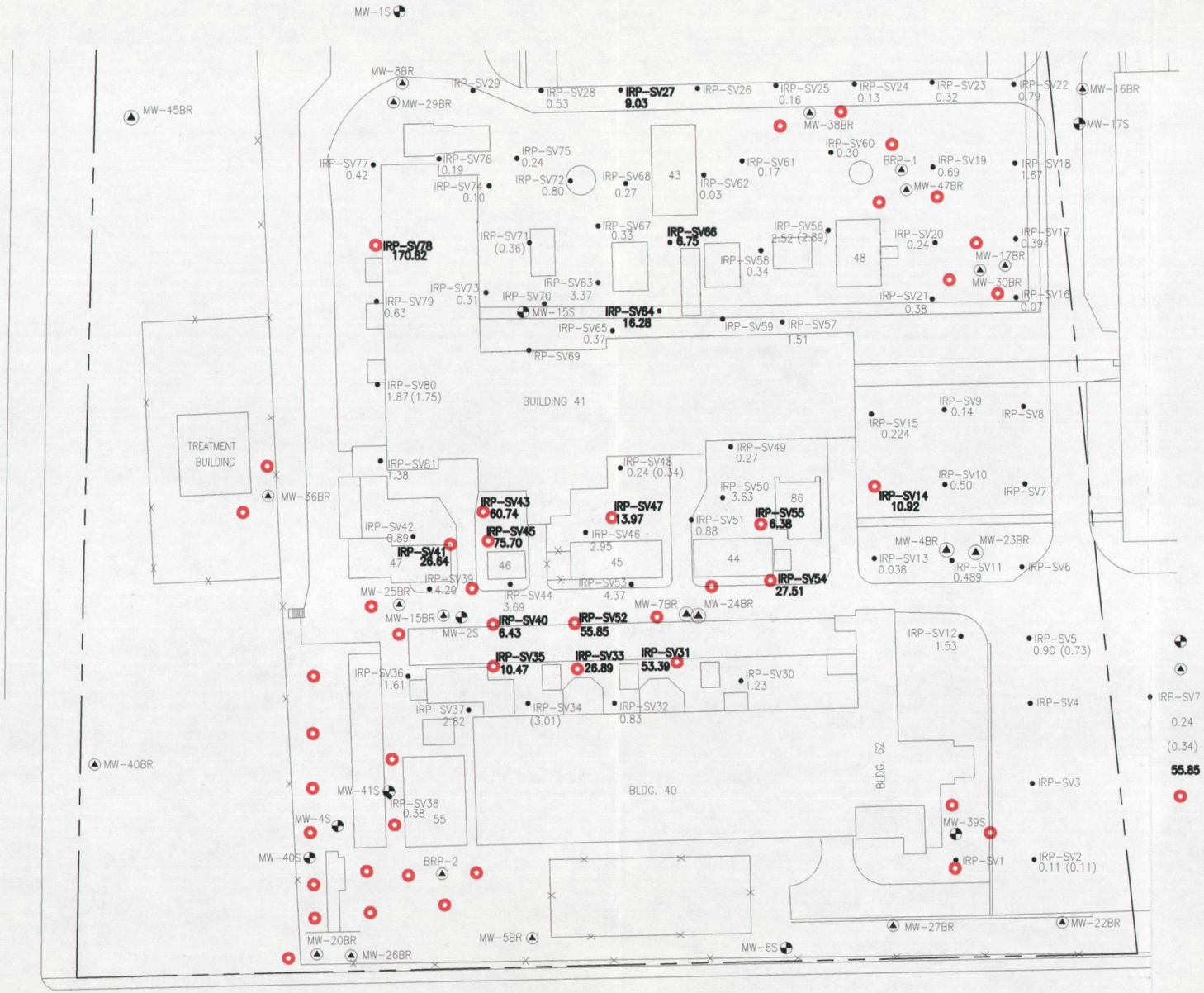

LEGEND

- OVERBURDEN MONITORING WELL
- BEDROCK MONITORING WELL
- IRP-SV7 PREVIOUS SVA SAMPLE LOCATION
- 0.24 SOIL GAS SAMPLE CONCENTRATION (ppm)
- (0.34) DUPLICATE SOIL GAS SAMPLE CONCENTRATION (ppm)
- **55.85** ELEVATED SOIL GAS SAMPLE CONCENTRATION (ppm)
- PROPOSED PASSIVE SOIL GAS SAMPLE LOCATION

NOTE: COMPOUNDS NOT IDENTIFIED OR QUANTIFIED IN SAMPLES IRP-SV1 AND IRP-SV34 DUE TO EXCESSIVE GC SYSTEM NOISE.

80 40 0 80

GRAPHIC SCALE IN FEET

FILE: Q:\PROJECTS\29600.48\2292\AREA-2B

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

IRP SITE 1 SOURCE SAMPLING
NAWC TRENTON
TRENTON, NEW JERSEY

PROPOSED PASSIVE SOIL GAS SAMPLE LOCATIONS

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.	FILE NAME
JD	MM	1-22-98	29600.48	AREA-2B
CHECKED BY	PROJECT MGR.	SCALE	DRAWING NO.	FIGURE
RH	SF	AS SHOWN	-	1

TABLE 1: ANALYTICAL SUMMARY FOR SITE I SOURCE SAMPLING

	Matrix	Method SW-846	No. of Samples	Field Duplicates[1]	Trip Blanks[2]	MS[3]	MSD[3]	Totals
Task 2 (Site 1 Source Sampling)								
TCL VOC	Soil	8260	21	2	8	2	2	35
TPH (Diesel-range organics)	Soil	8015	21	2	0	2	2	27

1 Duplicates collected 1/20 samples
2 Trip Blanks - 2/sample shipment for soil (1 volatile blank and 1 storage blank required by methanol preservation procedure for VOC soil samples)
3 *MS/MSD collected 1/20 samples*

REFERENCES

EA Engineering, Science and Technology. 1997. Environmental Baseline Survey (EBS) Phase II Report for Parcel B, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey. September.

EA Engineering, Science and Technology. 1996a. Environmental Baseline Survey Phase II Work Plan, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey. July.

EA Engineering, Science and Technology. 1996b. Environmental Baseline Survey Phase II Quality Assurance Project Plan, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey. July.

EA Engineering, Science and Technology. 1996c. Site Safety, Health, and Emergency Response Plan for EBS Phase II Facility Investigations, Naval Air Warfare Center, Aircraft Division, Trenton, New Jersey. October.

New Jersey Department of Environmental Protection. 1997. Technical Requirements for Site Remediation. N.J.A.C. 7:26E. February.

New Jersey Department of Environmental Protection. 1992. Field Sampling Procedures Manual. May.